

Patent Abstracts of Japan

PUBLICATION NUMBER : 08146201
PUBLICATION DATE : 07-06-96

APPLICATION DATE : 24-11-94
APPLICATION NUMBER : 06289395

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INT.CL. : G02B 1/10 C30B 25/06

TITLE : PRODUCTION OF OPTICAL THIN FILM

ABSTRACT : PURPOSE: To produce an optical thin film of high quality at a low cost by using a single crystal Si target to produce the thin film.

CONSTITUTION: In the production process of an optical thin film, a single crystal Si target is used to form a SiO_2 film by reactive sputtering in the environment into which at least two kinds of gases of a gas containing oxygen and an inert gas are introduced while impressing pulses of positive voltage on a DC power source. In this method, the resistance of the single crystal Si target is specified to $\leq 10\text{m}\Omega\cdot\text{cm}$. By this method, since no intergranular interface is present in the crystal different from a polycrystalline target, the surface roughness of the target is not increased. Therefore, arc discharge is hardly caused. The target has excellent uniformity in the target surface, and as a result, even when a film is formed on a large substrate, the film quality shows higher uniformity. By impressing pulses of positive voltage on the DC power source, charges hardly accumulate on the surface of the target.

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